DAU Webcast - Q&A's for SSE Website

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Q13. Please comment on how the discussions from today reflect on development programs in the space sector. DoD 5000 has been mentioned several times today, but the acquisition stages and emphasis on upfront engineering is very different in NSS 03-01 programs.

Q14. Describe SSE vision for integrating architectures, systems engineering, and software management.

Q1. How do we hold DoD PMs accountable for doing good SE?

A. It really boils down to a leadership issue from the top down to ensure systems engineering is properly addressed and implemented on programs. PM buy-in to a sound SE approach is key. This is why we have put a very strong emphasis on early technical planning. All too often, systems engineering is not built in to the overall program plan from the beginning and is therefore viewed as something to be "added in". A program plan with predictable performance (cost, schedule, and technical) is built upon a strong technical foundation – the systems engineering plan and approach. This approach should not only inform the acquisition strategy, but should also influence the solicitation and contracting process to set the expectation for offerors. In this way, good systems engineering is built-in to the program and not something extra that needs to be paid for. *Back to top*

Q2. Are examples of "good" SEPs available to give Systems Engineers a concrete idea what is expected, and what is "good?"

A. The main point is that it is not about the document, it's always been about the planning. The SEP itself is just an artifact, a necessary evil, if you will, to get to a shared stakeholder insight as to a program's planned technical approach. Hence, our guide is not about a boilerplate or "Golden" SEP, but rather offers the focus areas for sound technical planning, in the areas of requirements (all of them – statutory, regulatory, derived, certification), structuring the program and organizing against those requirements, having a technical baseline approach, managing those baselines via event-based technical reviews, and linkage of SE to other management efforts such as EVM and Risk Management. Fundamentally, the purpose of the SEP is to help programs think through their system engineering approach and how this approach helps set a firm foundation for the rest of the program (establishing the budget and schedule, understanding how performance trades will be made, what the products are of the SE effort and how these inform program decisions. It should become a key part of the acquisition strategy and built into the RFP. *Back to top*

Q3. Since Reliability is a challenge for so many programs, do you have any guidance that will allow programs to address this area and still meet the demands to complete development in a reasonable amount of time?

A. Yes, we have published a "DoD Guide for Achieving Reliability, Availability and Maintainability (RAM)" that focuses on what can be done to achieve satisfactory levels of RAM, successfully demonstrate them during operational test and evaluation and sustain them through the systems' life cycle. In doing so, the Guide defines a model for improving RAM management and technical processes that integrates with other processes while reflecting DoD, Industry and Academia best practices. With the recent addition of reliability as a KPP, now more than ever we are emphasizing the importance of considering sustainment and logistics issues upfront and early in the technical planning process.

The Guide is on our website at:
http://www.acq.osd.mil/se/publications/pig/RAM%20Guide%20(080305).pdf *Back to top*

Q4. We are attempting to institute a Systems Engineering Policy that is to be implemented in our DoD programs. Is there any vision of a biders requirement for this sort of policy, not just a CMMI level bragging point?

A. The Department advocates that "rigorous system engineering discipline is paramount to the Department's ability to meet the challenge of developing and maintaining needed warfighting capability." This responsibility resides not only with the government program offices but with the contractors as well as part and parcel to the overall teaming effort. Thus, through a new guide we expect to soon publish entitled "A Guide for Integrating Systems Engineering into DoD Acquisition Contracts," we are emphasizing the importance of implementing the technical strategy and technical planning into the Request for Proposal (RFP) as an essential element of the overall acquisition strategy. This involves not only performing the pre-award functions, including source selection, but post-award contractor execution activities as well. However, while we encourage integrating systems engineering requirements into the appropriate contracting elements in support of the acquisition of systems, it is not at the present time codified in any policy.   Back to top

Q5. What SE practices are you seeking across the defense industry (or commercial industry) that are making real improvements? Are you simply applying discipline and doing what we already know, or are there new practices?

A. We see a sound technical basis as a key enabler of acquisition now and in the future, and thus, our focus continues to be on promoting a "back to the basic's approach" with respect to systems engineering. This begins with setting a strong technical foundation for programs by placing early attention to technical planning and including this planning in the RFP and event-based technical reviews (with independent peers) so as to inform the decisions to enter the next technical phases of effort. We continue to work with the practitioner community to promulgate many new products (i.e. guides and education and training offerings) that reflect this approach and that are designed to aid the acquisition workforce in reinvigorating system engineering efforts within their respective programs.   Back to top

Q6. Do we have any initiatives to "fix" the broken SORAP Process?

A. Per the Depot Maintenance Programs, Strategic Plans office at AFMC, the AF plans to field a "Source of Repair Tool" to automate the SORAP process and improve workflow, communication, visibility, and accountability for all SORAP users. Current projection is for the new tool to be fielded and training of all users by Mid CY 2007. The objective of the tool is to speed up the decision process for consideration of Organic versus Contractor repair for depot level repairables within the framework of 10 USC 2464 and 2466 provisions.

A new Strategic Benefits Analysis has been developed that not only includes cost comparison, but also helps identify other contractor/organic benefits to the Air Force. This has already been made available and is located at the Source of Repair Community of Practice website: https://afkm.wpafb.af.mil/ASPs/CoP/EntryCoP.asp?Filter=OO-LG-MC-10   Back to top

Q7. How do you see Architecture artifacts and enterprise architecture planning being used to facilitate the acquisition process?

A. These are complementary to systems engineering activities and together provide a basis for acquisition decisions. Architecture artifacts are products of several core systems engineering processes, as stated in DAG sections 4.2.4.2. and 4.2.4.3. A functional (or logical) architecture is a major artifact resulting from the Logical Analysis process. Similarly, a design or physical architecture is a product of the Design Solution process. In addition to providing a linkage between these and follow-on processes, these architecture artifacts are the basis for design definition documentation such as specifications, baselines, and work breakdown structures. They also form part of the overall evolving system technical baseline that is evaluated to inform technical reviews.

Traditional systems engineering practices have defined functional and design architectures in very generic terms, such that these concepts can be applied to a broad range of systems. Enterprise architectures are commonly used to describe the overarching guidelines and high level design of an enterprise information system and are sometimes used to capture the broad decisions as an organization creates its enterprise-wide information support systems. So from this perspective, enterprise architectures are similar to the type of architecture artifacts commonly referred to in systems engineering practices.

Architecture is the bridge between the mission goals and the system. A proper architecture can serve as the basis for product lines and the systems that become a fundamental means of accomplishing DoD's missions. Because of their importance, we focus on architectures during our Program Support Reviews, along with the other fundamental aspects of system development.

Software acquisition and engineering is a part of system acquisition and engineering. The architecture describes hardware and software components in terms such as function, process, information or data flow, control mechanisms, failure modes, resources, timing as well as –ilities such as reliability and interoperability. A sound architecture facilitates the process of translating the system's requirements into an effective design.   Back to top

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Q8. I hear a lot on SE, but the cohesiveness of CM and QA are collaborative keys to SE adherence. Please address.

A. Agree. That is why we have addressed both of these areas (as well as others) in our updated guidance and in our education and training. Chapter 4 (Systems Engineering) of the Defense Acquisition Guidebook includes and discusses Configuration Management as one of eight key technical management processes encompassed by systems engineering, and quality is included as one of the many important design considerations that should be addressed early in the development phase and continuously throughout the lifecycle and evaluated as part of event-based technical reviews. They are also emphasized as key aspects of good technical planning in the Systems Engineering Plan Preparation Guide. We have recently launched a significant revision to the LOG 204 course on configuration management. In our guidance and training we have sought to reinforce how Configuration Management provides for traceability and requirements verification of technical baseline changes and helps facilitate quality in the design through translating and tracking desired capabilities into a system of interrelated design specifications and ultimately, a fielded product.   Back to top

Q9. What is a Program Support Review? Where is it documented? Why it is not mentioned in MIL-STD 1521C?

A. MIL-STD 1521C was cancelled in 1995 as part of the Department's move away from prescriptive specifications and standards. Current guidance for technical reviews is contained in the Defense Acquisition Guidebook, Chapter 4. The reviews described in the DAG are internal reviews planned and executed by the Program Manager with outside assistance from stakeholders, technical authorities and subject matter experts. A Program Support Review (PSR) is an independent, multidisciplinary, cross-functional review conducted by an organization outside of the Program. The PSR is documented in the Defense Acquisition Program Support (DAPS) methodology. DAPS methodology may be found at http://www.acq.osd.mil/se/as/publications.htm

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Q10. What is an Acquisition Strategy Report? Where is it documented?

A. Acquisition Strategy Report (ASR) is the commonly accepted name for the document in which the PM conveys the program's proposed acquisition strategy to the Milestone Decision Authority (MDA), and receives the MDA's approval of the strategy. The ASR is also referred to by some as the Acquisition Strategy Document or Acquisition Strategy Plan. The proper name is simply "Acquisition Strategy". An Acquisition Strategy is a regulatory requirement in DoDI 5000.2. Guidance for preparing an Acquisition Strategy is found in Defense Acquisition Guidebook, Chapter 2.3

Q11. Why isn't the engineering community connecting the reinvigoration of SE with the implementation, which clearly lends itself to be a significant contributor to Six Sigma Success?

A. There is a great deal of conceptual and practical similarity between Systems Engineering and Lean/6-sigma. We like to consider them as being of different scale. We apply Systems Engineering processes to improve major projects and we apply Lean/6-sigma projects to improve processes.

Q12. How does the reinvigoration bring SE back into importance even on Rapid Warfighting and Rapid Deployment programs? Much of the discussion is focused on large programs or traditional technology development. How will this initiative apply to small, quick programs?

A. H.R.4200, the Ronald W. Reagan National Defense Authorization Act for Fiscal Year 2005, includes authority for rapid acquisition to respond to combat emergencies. It states, "Upon designation of a senior official under subparagraph (A), the Secretary shall authorize that official to waive any provision of law, policy, directive, or regulation described in subsection (d) that such official determines in writing would unnecessarily impede the rapid acquisition and deployment of the needed equipment."

The SE process is always relevant, and can be tailored to fit the situation of the program. If an off-the-shelf product is available, the requirements decomposition and design steps on the left side of the "V" can be streamlined or abbreviated. The testing steps on the right side of the "V" can also be tailored. If there is little integration required, there is no need for the low-level module or component tests. Initial efforts can focus on higher level, more operationally realistic test events. Such a rapid effort is well suited for time and resource-saving integrated or combined DT/OT.

Q13. Please comment on how the discussions from today reflect on development programs in the space sector. DoD 5000 has been mentioned several times today, but the acquisition stages and emphasis on upfront engineering is very different in NSS 03-01 programs.

A. National Security Space Acquisition Policy (NSS 03-01) was delegated to the Air Force. Although the emphasis on upfront engineering is somewhat different, the System Engineering principles addressed in the Defense Acquisition Guidebook are the same.   Back to top

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Q14. Describe SSE vision for integrating architectures, systems engineering, and software management.

A. More and more of our system functionality is dependent on software, yet we have seen numerous shortfalls in software development and management during our Program Support Reviews. The President's Information Technology Advisory Committee has also identified software as a major vulnerability, yet DoD's software research funding has been declining over the years. To address these shortfalls and strengthen the bonds between systems and software engineering, we have created a Deputy Director for Software Engineering and Systems Assurance, and changed the name of our group to Systems and Software Engineering.

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Software acquisition and engineering is a part of system acquisition and engineering. The architecture describes hardware and software components in terms such as function, process, information or data flow, control mechanisms, failure modes, resources, timing as well as –ilities such as reliability and interoperability. A sound architecture facilitates the process of translating the system's requirements into an effective design.   Back to top